

IN THE CLAIMS:

The status of each claim that has been introduced in the above-referenced application is identified in the ensuing listing of the claims. This listing of the claims replaces all previously submitted claims listings.

1. (Original) A method for insulating at least one aperture formed through a substrate, comprising:
introducing a quantity of unconsolidated dielectric material into the at least one aperture; and
selectively consolidating unconsolidated dielectric material located adjacent to a periphery of the at least one aperture to form an insulative coating on surfaces of the at least one aperture.
2. (Currently Amended) The method of claim 1, wherein ~~said~~ introducing comprises introducing a quantity of unconsolidated UV-curable dielectric material into the at least one aperture.
3. (Currently Amended) The method of claim 2, wherein ~~said~~ selectively consolidating comprises exposing portions of ~~said~~the unconsolidated UV-curable dielectric material to UV radiation in the form of a laser beam.
4. (Currently Amended) The method of claim 1, wherein ~~said~~ introducing comprises dispensing ~~said~~the quantity of unconsolidated dielectric material into the at least one aperture.
5. (Currently Amended) The method of claim 1, wherein ~~said~~ introducing comprises lowering a level of the substrate relative to a level of a volume of ~~said~~the unconsolidated dielectric material.
6. (Currently Amended) The method of claim 1, wherein ~~said~~ selectively consolidating comprises directing an energy beam onto selected regions of ~~said~~the quantity of unconsolidated dielectric material.

7. (Currently Amended) The method of claim 1, further comprising: repeating ~~said~~ introducing and ~~said~~ selectively consolidating at least once to form another layer of ~~said~~the insulative coating.

8. (Original) The method of claim 1, further comprising: removing unconsolidated dielectric material remaining within the at least one aperture.

9. (Currently Amended) The method of claim 8, wherein, upon ~~said~~ removing, a via hole that extends through ~~said~~the insulative coating is exposed.

10. (Currently Amended) A method for forming electrically conductive vias through a substrate, comprising:
forming at least one precursor hole through the substrate;
introducing unconsolidated dielectric material into ~~said~~the at least one precursor hole; and
selectively consolidating portions of ~~said~~the unconsolidated dielectric material at locations adjacent to a periphery of ~~said~~the at least one precursor hole to form a layer of an insulative coating on surfaces of ~~said~~the at least one precursor hole.

11. (Currently Amended) The method of claim 10, wherein ~~said~~ forming comprises forming ~~said~~the at least one precursor hole to have one of a substantially cylindrical shape, a substantially frustoconical shape, an hourglass shape, and a bulging center.

12. (Currently Amended) The method of claim 10, wherein ~~said~~ forming includes drilling through the substrate.

13. (Currently Amended) The method of claim 12, wherein ~~said~~ forming further includes trepanning the substrate.

14. (Currently Amended) The method of claim 10, wherein ~~said~~ introducing comprises introducing an unconsolidated UV-curable dielectric material into ~~said~~the at least one precursor hole.

15. (Currently Amended) The method of claim 14, wherein ~~said~~ selectively consolidating comprises exposing portions of ~~said~~the UV-curable dielectric material to UV radiation in the form of a laser beam.

16. (Currently Amended) The method of claim 10, wherein ~~said~~ introducing comprises dispensing ~~said~~the unconsolidated dielectric material into ~~said~~the at least one precursor hole.

17. (Currently Amended) The method of claim 10, wherein ~~said~~ introducing comprises lowering a level of the substrate relative to a level of a volume of unconsolidated dielectric material.

18. (Currently Amended) The method of claim 10, wherein ~~said~~ selectively consolidating comprises directing an energy beam onto ~~said~~the portions of ~~said~~the unconsolidated dielectric material.

19. (Currently Amended) The method of claim 10, further comprising: repeating ~~said~~ introducing and ~~said~~ selectively consolidating at least once to form another layer of ~~said~~the insulative coating.

20. (Currently Amended) The method of claim 10, further comprising: removing unconsolidated dielectric material remaining within ~~said~~the at least one precursor hole.

21. (Currently Amended) The method of claim 20, wherein, upon ~~said~~ removing, a via hole that extends through ~~said~~the insulative coating is exposed.

22. (Currently Amended) The method of claim 21, further comprising: introducing conductive material into saidthe via hole.

23. (Currently Amended) The method of claim 22, wherein said introducing conductive material comprises introducing at least one of polysilicon, a metal, a metal alloy, a conductive elastomer, and a conductor-filled elastomer into saidthe via hole.

24. (Currently Amended) The method of claim 22 wherein said introducing conductive material comprises at least one of physical vapor depositing, chemical vapor depositing, electrolytic plating, electroless plating, and immersion plating.

25. (Currently Amended) The method of claim 22, wherein said introducing conductive material comprises dispensing saidthe conductive material.

26. (Withdrawn and currently Amended) A semiconductor device structure, comprising:
a substrate;
at least one aperture extending through saidthe substrate; and
an insulative coating on each surface of saidthe at least one aperture, comprising a plurality of superimposed, contiguous, mutually adhered material layers, and forming a via hole through saidthe substrate.

27. (Withdrawn and currently Amended) The semiconductor device structure of claim 26, wherein saidthe insulative coating comprises polymer.

28. (Withdrawn and currently Amended) The semiconductor device structure of claim 27, wherein saidthe polymer comprises a UV-cured polymer.

29. (Withdrawn and currently Amended) The semiconductor device structure of claim 26, further comprising:

a conductive via within and extending through saidthe via hole.

30. (Withdrawn and currently Amended) The semiconductor device structure of claim 29, wherein saidthe conductive via comprises at least one of polysilicon, a metal, a metal alloy, a conductive elastomer, and a conductor-filled elastomer.

31. (Withdrawn and currently Amended) The semiconductor device structure of claim 26, comprising a plurality of apertures extending through saidthe substrate, each aperture of saidthe plurality of apertures being lined with an insulative coating comprising polymer.

32. (Withdrawn and currently Amended) A system for forming conductive vias through substrates, comprising:
an aperture-forming element configured to form at least one precursor hole in a substrate;
a dielectric material-introducing element configured to introduce unconsolidated dielectric material into saidthe at least one precursor hole; and
a material consolidation element configured to selectively consolidate unconsolidated dielectric material located adjacent to a surface of saidthe at least one precursor hole.

33. (Withdrawn and currently Amended) The system of claim 32, wherein saidthe aperture-forming element comprises at least one of a router, a mechanical drill, and a laser drill.

34. (Withdrawn and currently Amended) The system of claim 32, wherein saidthe aperture-forming element is configured to effect a trepanning process.

35. (Withdrawn and currently Amended) The system of claim 32, wherein saidthe dielectric material-introducing element is configured to dispense saidthe unconsolidated dielectric material into saidthe at least one precursor hole.

36. (Withdrawn and currently Amended) The system of claim 32, wherein said the dielectric material-introducing element comprises a fabrication tank of a stereolithography apparatus.

37. (Withdrawn and currently Amended) The system of claim 32, wherein said the material consolidation element comprises a source of an energy beam.

38. (Withdrawn and currently Amended) The system of claim 37, wherein said the source comprises a laser.

39. (Withdrawn and currently Amended) The system of claim 38, wherein said the laser is configured to generate a UV laser beam.

40. (Withdrawn and currently Amended) The system of claim 32, further comprising: an unused material-removal element configured to remove unconsolidated dielectric material from said the at least one precursor hole following use of said the material consolidation element.

41. (Withdrawn and currently Amended) The system of claim 32, further comprising: a conductive material introduction element.

42. (Withdrawn and currently Amended) The system of claim 41, wherein said the conductive material introduction element is configured to dispense conductive material into a via hole that extends through an insulative coating formed by selectively consolidated insulative material.

43. (Withdrawn and currently Amended) The system of claim 41, wherein said the conductive material introduction element comprises at least one of a physical vapor deposition

chamber, a chemical vapor deposition chamber, an electrolytic plating bath, and an electroless or immersion plating bath.

44. (Withdrawn and currently Amended) A surface level control system for a stereolithographic fabrication tank, comprising:

at least one aperture defined through a side wall of the stereolithographic fabrication tank; and
at least one receptacle for receiving unconsolidated material from the stereolithographic fabrication tank in communication with saidthe at least one aperture.

45. (Withdrawn and currently Amended) The surface level control system of claim 44, wherein saidthe at least one aperture is configured and located so as to remove a displaced volume of saidthe unconsolidated material from the stereolithographic fabrication tank.

46. (Withdrawn and currently Amended) The surface level control system of claim 44, wherein a bottom edge of saidthe at least one aperture is located at an elevation on saidthe side wall which is at about a desired location of a surface level of saidthe unconsolidated material within the stereolithographic fabrication tank.

47. (Withdrawn and currently Amended) The surface level control system of claim 44, further comprising:

a material recycling element in communication with saidthe at least one receptacle and the stereolithographic fabrication tank and configured to transport material within saidthe at least one receptacle into the stereolithographic fabrication tank.